IN THE CLAIMS:

Please amend the claims as follows:

1. (cancelled)

2. (currently amended) The system of claim ~~1~~ 34, wherein said gravity gradiometer is a crossed dumbbell type gravity gradiometer.

3. (currently amended) The system of claim ~~1~~ 34, wherein said coarse stage isolation mount has a first natural frequency and said first natural frequency exceeds said second low pass cutoff frequency.

4. (currently amended) The system of claim ~~1~~ 34, wherein said coarse stage isolation mount controls ~~a~~ displacement of said fine stage isolation mount relative to said ~~vehicle~~ aircraft.

5. (currently amended) The system of claim 4 ~~further comprising a mobile vehicle~~ including an aircraft, wherein said coarse stage isolation mount is mounted ~~to~~ in said ~~mobile vehicle~~ aircraft and wherein said ~~mobile vehicle~~ aircraft ~~comprises~~ includes a navigation system and a flight control system, said flight control system and said navigation system interacting ~~so as~~ to control a flight path of said ~~mobile vehicle~~ aircraft, said flight control system operable by at least one of a human pilot and an autopilot system.

6. (currently amended) The system of claim 5, wherein said coarse stage isolation mount communicates with said navigation ~~system~~ and flight control systems whereby accelerations of ~~said communication causing~~ said fine stage isolation mount ~~to travel along a flight path that is substantially smoother than said flight path of~~ are substantially less than accelerations of the aircraft during flight, and

consequently said fine state isolation mount and said gradiometer are caused to travel along a smoother flight path than the ~~mobile vehicle~~ aircraft.

7. (cancelled)

8. (currently amended) The system of claim ~~1~~ 34 ~~further comprising~~ including:

~~a mobile vehicle~~ an aircraft housing said gravity gradiometer, said coarse stage isolation mount, and said fine stage isolation mount ~~and said gravity gradiometer~~.

9. (cancelled)

10. (currently amended) The system of claim 8, wherein said coarse stage isolation mount ~~comprises~~ includes a control system for determining and controlling ~~a~~ the position of said fine stage isolation mount in at least one of three translational degrees of freedom.

11. (currently amended) The system of claim 10, wherein said coarse stage isolation mount ~~further comprises~~ includes a control system for determining and controlling said position of said fine stage isolation mount relative to a smoothed representation of ~~said~~ a flight path of said ~~mobile vehicle~~ aircraft ~~where said controlling is constrained by interior dimensions of said mobile vehicle~~.

12. (currently amended) The system of claim 10, wherein said fine stage isolation mount ~~comprises~~ includes a control system for determining and controlling ~~a~~ the position of said gravity gradiometer in the six degrees of freedom associated with motion of a rigid body.

13. (currently amended) The system of claim 12, wherein said control system of said ~~coarse~~ fine stage isolation mount directs said fine stage isolation mount

towards a home position~~, where said home position is~~ measured relative to ~~said coarse stage~~ the aircraft.

14. (currently amended) The system of claim ~~1~~ 34, wherein said ~~first low pass cutoff frequency is adjustable~~ coarse stage isolation mount includes an adjustable control system for attenuating displacements of the gradiometer at various low pass cutoff frequencies according to motion characteristics of a selected ~~vehicle~~ aircraft and acceleration response characteristics of said gravity gradiometer.

15. (currently amended) The system of claim 14, wherein said fine stage isolation mount comprises a control system for determining and controlling a position of said gravity gradiometer in the six degrees of freedom associated with motion of a rigid body.

16. (cancelled)

17. (currently amended) The system of claim ~~16~~ 34, wherein said fine stage isolation mount ~~further comprises~~ includes:

a base mounted on said coarse stage isolation mount;

a floater magnetically levitated relative to said base, said floater providing a mount for said gravity gradiometer;

a plurality of accelerometers adapted to measure said vibrations; and

a plurality of position sensors adapted to measure a relative position of said floater with respect to said base in the six degrees of freedom associated with motion of a rigid body~~; and~~.

~~said base mounted to said coarse stage isolation mount.~~

18. (currently amended) The system of claim 17, wherein said accelerometers are at least one of linear accelerometers~~, gyroscopes~~ and rotational accelerometers.

19. (cancelled)

20. (cancelled)

21. (currently amended) An apparatus for measuring gravity gradients comprising:

a gravity gradiometer;

a means for isolating~~, above a first low pass cutoff frequency~~, displacements of the gradiometer above a first low pass cutoff frequency; and

a means for isolation~~, above a second low pass cutoff frequency~~, vibrations of the gradiometer above a second low pass cutoff frequency, where said vibrations are characterized by a minimum frequency, ~~where~~ said second low pass cutoff frequency ~~is~~ being greater than said first low pass cutoff frequency and less than said minimum frequency of said vibrations, and

~~a gravity gradiometer mounted to said means for isolating vibrations; and~~

~~where~~ wherein said means for isolating vibrations is mounted ~~to~~ on said means for isolating displacements.

22. (currently amended) The apparatus of claim 21, wherein said means for isolating vibrations is ~~at least one of a pneumatic mount and~~ a magnetically levitated isolation mount.

23. (currently amended) A method for obtaining fine resolution gravity gradient data comprising:

transporting a gravity gradiometer in ~~a mobile vehicle, said mobile vehicle~~ an aircraft experiencing accelerations and displacements;

isolating, in a coarse stage, ~~isolating,~~ above a first low pass cutoff frequency, said accelerations and displacements;

isolating, in a fine stage, ~~isolating,~~ above a second low pass cutoff frequency, said accelerations and displacements, where said accelerations and displacements are characterized by a minimum frequency, where said second low pass cutoff frequency is greater than said first low pass cutoff frequency and less than said minimum frequency of said ~~vibrations~~ accelerations and displacements;

tracking a position of said ~~mobile vehicle~~ aircraft in the six degrees of freedom associated with motion of a rigid body;

during said isolating said accelerations and displacements in said coarse and fine stages, measuring gravity gradients using a gravity gradiometer; and

tabulating said gravity gradients as a function of said position of said ~~mobile vehicle~~ aircraft.

24. (currently amended) The method of claim 23, wherein said tracking comprises:

identifying said position of said ~~mobile vehicle~~ aircraft using at least one of an inertial navigation system ~~(INS)~~ and a global positioning system ~~(GPS)~~.

25. (currently amended) The method of claim 24, wherein isolating said accelerations and displacements in said fine stage comprises:

measuring accelerations of a floater magnetically levitated relative to a base using electromagnets~~, said floater magnetically levitated relative to said base by use of electromagnets~~;

measuring ~~relative~~ the position of said floater ~~with respect~~ relative to said base; and

compensating for said accelerations through variable application of current through said electromagnets.

26. (currently amended) The method of claim 23, wherein ~~said~~ isolating of said accelerations and displacements in said coarse stage comprises:

measuring accelerations of said fine stage,

measuring ~~relative~~ the position of said fine stage relative to the aircraft; and

counteracting said accelerations measured through application of counteracting force to the coarse stage.

27. (currently amended) The method of claim 26, wherein ~~said~~ isolating of said accelerations and displacements in said coarse stage ~~further comprises~~ includes:

determining said position of said fine stage relative to said ~~mobile vehicle~~ aircraft;

applying forces to said fine stage responsive to said position determined so as to reposition said fine stage towards a home position in, and relative to, said ~~mobile vehicle~~ aircraft.

28. (cancelled)

29. (cancelled)

30. (cancelled)

31. (currently amended) An aircraft generating data corresponding to gravity gradient measurements, said aircraft comprising:

a gravity gradiometer mounted in the aircraft;

a coarse stage isolation mount mounted in the aircraft adapted to attenuate, above a first low pass cutoff frequency, displacements~~, said coarse stage mounted within said aircraft~~ of the gradiometer relative to a flight path ideal to the measurement of gravity gradient; and

a fine stage isolation mount mounted on said coarse stage isolation mount adapted to attenuate, above a second low pass cutoff frequency, vibrations of said gradiometer relative to a flight path ideal to the measurement of gravity gradient, where said vibrations are characterized by a minimum frequency, ~~where~~ said second low pass cutoff frequency ~~is~~ being greater than said first low pass cutoff frequency and less than said minimum frequency of said vibrations. ~~said fine stage isolation mount mounted to said coarse stage isolation mount; and~~

~~a gravity gradiometer mounted to said fine stage isolation mount.~~

32. (cancelled)

33. (cancelled)

34. (new) A gravity gradient measuring system for use in an aircraft comprising:

a gravity gradiometer for mounting in an aircraft;

a coarse stage isolation mount for mounting in an aircraft adapted to attenuate, above a low pass cutoff frequency, displacements of the gradiometer relative to a flight path ideal to the measurement of gravity; and

a fine stage isolation mount carried by said coarse stage isolation mount and supporting said gradiometer for attenuating, above a second low pass cutoff frequency, vibrations of the gradiometer relative to a flight path ideal to the measurement of gravity gradient.